Paro-endo: een paar apart?

J.H. Weijmar
Vakgroep Implantologie & Parodontologie
UMC St. Radboud

Paro-endo: een paar apart?

Classificatie Paro – endo problematiek
Furcaties therapie
Chronische parodontitis
Agressieve parodontitis

Classificatie Paro-endo

J.H.S. Simon, D.H. Glick, A.L. Frank (1972):
The relationship of endodontic-periodontic lesions

Primaire endodontische laesie
Primaire endodontische laesie met secundaire parodontale component

Primary endodontic disease in a mandibular first molar with a necrotic pulp. (A) Preoperative radiograph showing periapical and interradicular radiolucencies. (B) Radiograph taken upon completion of root canal treatment. (C) Two-year follow-up radiograph showing evidence of bony healing.

Smalle sondeerbare "pocket"
“Maar” smalle sondeerbare pocket ook bij:

- adjacent pulpless tooth
- development grooves
- fused roots

M3 sup

- adjacent pulpless tooth
- development grooves
- fused roots
- cracked tooth
- crown-root fractures
- vertical root fractures
“Maar” smalle sondeerbare pocket ook bij:

- adjacent pulpless tooth
- development grooves
- fused roots
- cracked tooth
- crown-root fractures
- vertical root fractures
- enamel spurs

M3 inf met „glazuurparel“

Classificatie

- Primaire endodontische laesie
- Primaire endodontische laesie met secundaire parodontale component
- Primaire parodontale laesie
- Primaire parodontale laesie met secundaire endodontische component
Primary periodontal disease with secondary endodontic involvement in a maxillary premolar. (A) Radiograph showing a bone loss in one-third of the root and a separate periapical radiolucency. The crown was intact but pulp sensitivity tests were negative. (B) Radiograph taken immediately following root canal therapy showing lateral canal that was exposed to the oral environment due to bone loss. Exposure lateral canal is one of the potential pathways of infection of the root canal.

Paro - endo


Unless periodontal disease extends all the way to the tooth apex, periodontal disease and treatment have negligible effect on the pulp.

Female, age 50, long-standing recurrent periodontal infection. The periodontal disease on the mandibular left central incisor was treated surgically. Routine periodontal maintenance was carried out in 3–4-month intervals. Three years postoperatively, the gain of clinical attachment was 5mm on the distal aspect of this tooth. The tooth has remained vital throughout the observation period.

Fig. 3. Male, age 57, long-standing periodontal disease in multiple sites. Advised root resection and endodontic treatment on maxillary right first molar. Patient declined recommended treatment but agreed to surgical debridement. The patient was on periodic periodontal (non-surgical) maintenance treatment throughout the observation period. At the 18-year recall visit, the tooth was still in place and the gain of clinical attachment was 6mm in the furcation area. The tooth is vital (positive response to cold test).

Classificatie

- Primaire endodontische laesie met secundaire parodontale component
- Primaire parodontale laesie met secundaire endodontische component
- Echte combinatie laesie die onafhankelijk van elkaar ontstaan zijn
Fig. 31. True combined endodontic-periodontal disease in a mandibular first molar. Radiograph showing separate progression of endodontic and periodontal disease. The tooth remained untreated and consequently the two lesions joined together.

Fig. 33. True combined endodontic-periodontal diseases in a mandibular first molar. (A) Preoperative radiograph showing periradicular radiolucencies. Pulp sensitivity tests were negative. (B) Immediate postoperative radiograph of nonsurgical endodontic treatment. (C) Six-month follow-up radiograph showing no healing. Gutta-percha cone is inserted in the buccal gingival sulcus. (D) Clinical photograph showing treatment of the root surfaces and removal of the periradicular lesion. (E) One-year follow-up radiograph demonstrating healing.
Furcatie kanalen

Komen voor bij 55 – 75 % van alle molaren en meerwortelige premolaren tot 25 % zijn doorgankelijk

GUTMANN 1978

Furcatie therapie

For multirooted teeth, furcation involved teeth
Subgingival debridement
→ No biocompatible rootsurface
For multirooted teeth, furcation involved teeth surgical approach
→ biocompatible root surface

Degree I: SRP, furcation plasty (odontoplasty, osteoplasty)

Periodontal treatment of multirooted teeth.
Results after 5 years
Hamp SE, Nyman S, Lindhe J JCP 1975:2:126-135

81 teeth with furcation degree I involvement
Treatment: SRP, furcation plasty

After 5 years no tooth lost;
3 surfaces developed caries during 5 years
PPD years ≤ 3mm: 77; 4-6mm: 4; > 6mm: 0 Total: 81

Degree II, III: Tunnel

The prognosis of tunnel preparations in treatment of class III furcations. A follow-up study

Long-term prognosis of tunnel preparations
102 patients, 149 teeth treated by tunnel preparation
Mean observation period: 37.5 months (range: 10 – 107 months)
35 teeth developed caries (23.5%)
12 due to caries extracted or hemisected (8%)

→ 73% caries free and in function
Degree II, III: Tunnel

Periodontal treatment of multirooted teeth. Results after 5 years. 
Hamp SE, Nyman S, Lindhe J JCP 1975:2.126-13
The prognosis of tunnel preparations in treatment of class III furcations. A follow-up study. 

Tunnel preparations should be considered a valid treatment option
But caution: risk for root sensitivity and root carious

Wortelresectie

The role of resective periodontal surgery in the treatment of furcation defects 
Massimo Desanctis & Kevin G. Murphy

Wortelresectie

Figure 5. In a resorbed tooth sector, the binominal crown-to-tooth distance should not be less than 3 mm to facilitate the accessibility of the periodontium, and the distance between the floor of the pulp chamber and the roots of the furcation. A measurement of 5 mm will ensure a good result. The distance of 2 mm between the furcation tooth structure and 5 mm for the suprastructure at least 5 mm allows for a reliable connection of two teeth.
LONG-TERM EFFECTS OF ROOT-RESECTIVE THERAPY IN FURCATION-INVOLVED MOLARS. A 10-YEAR LONGITUDINAL STUDY.


Table 4. Causes and time of extraction during the 10 years period of the study

<table>
<thead>
<tr>
<th>Cause of extraction</th>
<th>Test (n=175)</th>
<th>Control (n=175)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>time of extraction*</td>
<td>time of extraction*</td>
</tr>
<tr>
<td>Endodontic complication</td>
<td>4 3-5-6-7</td>
<td>4 3-5-6-7</td>
</tr>
<tr>
<td>Root curvatures</td>
<td>3 7-8-9</td>
<td>3 7-8-9</td>
</tr>
<tr>
<td>Periodontal disease recurrence</td>
<td>3 7-10-10</td>
<td>3 7-10-10</td>
</tr>
<tr>
<td>Root fractures</td>
<td>2 7-10</td>
<td>2 7-10</td>
</tr>
<tr>
<td>Cement wash out</td>
<td>1 10</td>
<td>1 10</td>
</tr>
</tbody>
</table>

*Year of maintenance.

Fig. 2. Survival rate of test (solid line) and control (dotted line).

THE ROLE OF RESECTIVE PERIODONTAL SURGERY IN THE TREATMENT OF FURCATION DEFECTS

MASSIMO DESANCTIS & KEVIN G. MURPHY; PERIODONTOLOGY 2000, VOL. 22, 2000, 154–168

Predisposition to furcation involvement

- Accumulation of plaque
- Aberrant root forms
- Enamel projections
- Accessory pulp canals
- Size and location of the furcation

Table 5. Contraindications for root resection and separation treatment

<table>
<thead>
<tr>
<th>Contraindications for root resection and separation treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe caries in periodontal surgery</td>
</tr>
<tr>
<td>Secondary forms of root resection</td>
</tr>
<tr>
<td>Prolonged periodontal disease</td>
</tr>
<tr>
<td>Necrotic bone or bone necrosis</td>
</tr>
<tr>
<td>Invasive bone or bone necrosis</td>
</tr>
<tr>
<td>Extensive periodontal disease</td>
</tr>
<tr>
<td>Extensive root resection</td>
</tr>
<tr>
<td>Extensive root resection with involvement of cementum</td>
</tr>
</tbody>
</table>

Table 6. Indications for root resection and separation treatment

<table>
<thead>
<tr>
<th>Indications for root resection and separation treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Severe root resorption</td>
</tr>
<tr>
<td>Severe root resorption with involvement of cementum</td>
</tr>
<tr>
<td>Severe root resorption with involvement of bone</td>
</tr>
<tr>
<td>Severe root resorption with involvement of bone necrosis</td>
</tr>
<tr>
<td>Severe root resorption with involvement of invasive bone</td>
</tr>
</tbody>
</table>
The role of resective periodontal surgery in the treatment of furcation defects


### Table 6: Comparison of characteristics of class furcation defects for periodontal procedures used to manage furcation defects (modified from Melály 1997)

<table>
<thead>
<tr>
<th>Degree</th>
<th>Recommended Therapy</th>
<th>Case No.</th>
<th>% Complete Healed</th>
<th>% Sealed</th>
<th>% Resealed</th>
<th>% Abscesses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree II, III</td>
<td>Root resection</td>
<td>1</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>GTR</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>GTR plus root plana</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

#### Recommended therapy

- **Degree II, III: root resection**

- **Degree II: GTR** mandibular molars

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**Carnevale G, Pontoriero R, Lindhe J**

Treatment of Furcation Involved Teeth

Clinical periodontology and Implant Dentistry

Lindhe J, Lang NP, Karring T (eds)

5th edition 2008

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**BioOss®**

5 mm hCAL

Granulation tissue

7 mm vBL
Chronische parodontitis

E.W. van de Weerdhof

Gender: male
Date of birth: 01-12-1954
Age at intake: 49
Marital state: married, no children
Profession: warehouse-chief

Chief complaint: Bleeding gums, retraction of gums
Reason for referral: Periodontal problems

General Medical History: diabetes

Intake (30-08-2004)
Plaque and bleeding scores

Periodontal chart intake (30-08-2004)

Overview of the radiographs

Overview of the radiographs

Overview of the radiographs

Overview of the radiographs
Diagnosis
Chronic Periodontitis

Etiology
Bacterial Plaque

Opmerkingen
Diagnose bij de patiënt is chronische parodontitis (Armitage 1999).

In het verleden zou de diagnose adulte parodontitis zijn geweest volgens het "Consensus reports of the World Workshop in Clinical Periodontics (1989) and of the 1st European Workshop on Periodontology (1994)."

Van der Velden (2005) stelde een andere classificatie voor. Volgens deze classificatie is de diagnose gegeneeraliseerde ernstige parodontitis. Deze classificatie geeft mogelijk een beter beeld van de parodontitis bij deze patiënt.

Preliminary treatment plan at intake
- Oral hygiene instruction
- Extraction of 18, 28, 38, 48 during IT
- Initial therapy
- Correction of plaque promoting restoration 27d
- Re-evaluation of oral hygiene and periodontal state
- Possible periodontal surgery
- Supportive periodontal therapy
- Control of endodontically treated 26
Reevaluation (12-01-2005; 3 months after IT)

- No calculus
- No plaque

Definitive treatment plan

- Additional oral hygiene instruction
- Supportive periodontal therapy
- Re-evaluation of periodontal state after one year
- Control of endodontically treated 26

Final full occlusion view (14-03-2007, > 2 years after IT)

No calculus
No plaque
Conclusion

In principle we are able to treat severe periodontitis even in medically compromised patients (diabetes) without any surgical approach!

Diabetes and Periodontitis

Diabetes Type 1

Periodontitis

Results

Diabetes mellitus promotes periodontal destruction in children
Lalla et al. JCP 2007:34:294-298
**Diabetes mellitus promotes periodontal destruction in children**

Lalla et al. JCP 2007:34:294-298

**Conclusions**

- Association between diabetes and an increased risk for periodontal destruction even very early in life
- Programs to address periodontal needs should be the standard of care for diabetic youth

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**Glycemic control of type 2 diabetes and severe periodontal disease in the US adult population**


**Aim**

Association between glycemic control of type 2 diabetes mellitus and severe periodontal disease in the US adult population ages 45 years and older.

**Material and Methods**

- National Health and Nutrition Examination Study III (representative study; Data on 4,443 persons ages 45–90 years )
- Weighted multivariable logistic regression
- Severe periodontal disease := ≥ 2 sites with ≥ 6 mm AL and ≥ 1 site with PPD ≥ 5 mm
- Individuals with fasting plasma glucose > 126 mg/dL were classified as having diabetes;
- Poorly controlled diabetes (PCDM) - glycosylated hemoglobin > 9%
- Better-controlled diabetes (BCDM) - glycosylated hemoglobin ≤ 9%

**Results**

- PCDM: significantly higher prevalence of severe periodontitis than those without diabetes (odds ratio = 2.90; 95% CI: 1.40, 6.03)
- BCDM: tendency (but not statistically sig.) for a higher prevalence of severe periodontitis (odds ratio = 1.56; 95% CI: 0.90, 2.68)

**Conclusions**

These results provide population-based evidence to support an association between poorly controlled type 2 diabetes mellitus and severe periodontitis.
Effects of diabetes mellitus on periodontal and peri-implant conditions: update on associations and risk
Salvi et al. JCP 2008:35(suppl):398-409

Results

Table 1: Association of diabetes type 1 and type 2 with peri-implantitis.

<table>
<thead>
<tr>
<th>Peri-implantitis</th>
<th>Diabetes type</th>
<th>Odds ratio (OR)</th>
<th>95% confidence interval (CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control group</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Test group</td>
<td>1.0</td>
<td>1.0</td>
<td>1.0</td>
</tr>
<tr>
<td>Type 1 diabetes</td>
<td>2.0</td>
<td>1.1</td>
<td>1.0</td>
</tr>
<tr>
<td>Type 2 diabetes</td>
<td>2.0</td>
<td>1.1</td>
<td>1.0</td>
</tr>
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Conclusions

"... poor glycemic control of both type 1 and type 2 diabetes emerged as a significant risk factor for periodontitis."

Glycemic control

Treatment of Periodontitis in diabetic patients

Glycemic control

Periodontal therapy in diabetic patients

Effect of non-surgical periodontal therapy on clinical and immunological response and glycaemic control in type 2 diabetic patients with moderate periodontitis
Navarro Sanchez et al. JCP:2007:34:835-843

Results

Table 2: Mean values and mean change (MC) in periodontal clinical parameters during the study period diabetes group = 0, control group = 8 patients

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<td>432.1</td>
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Conclusions

Local efficacy of non-surgical periodontal therapy between type 2 diabetic and non-diabetic patients and the effect of periodontal therapy on glycemic control.

Material and Methods

- 20 patients (10 diabetic and 10 non-diabetic)
- Design: Baseline, periodontal therapy, 3 months, 6 months examination

Aim

Effect of non-surgical periodontal therapy on clinical and immunological response and glycaemic control in type 2 diabetic patients with moderate periodontitis
Navarro Sanchez et al. JCP:2007:34:835-843

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Conclusions

Local efficacy of non-surgical periodontal therapy between type 2 diabetic and non-diabetic patients and the effect of periodontal therapy on glycemic control.
Results

Effect of non-surgical periodontal therapy on clinical and immunological response and glycaemic control in type 2 diabetic patients with moderate periodontitis

Navarro-Sanchez et al. JCP:2007:34:835-843

| Table 1. Mean values and mean changes (ED) in biochemical variables and in the HbA1C value during the study period (diabetic group = D, control group = C) |
|---|---|---|---|---|---|
| | Time 1 | Time 2 | Time 3 | D-3 | C-3 |
| Volume of GCF (μL) | Diabetic group | 10.0 ± 2.0 | 10.2 ± 3.0 | 10.5 ± 1.5 | -0.5 ± 0.7* | -0.3 ± 0.6* |
| | Control group | 9.0 ± 2.0 | 9.2 ± 2.1 | 9.5 ± 1.5 | -0.5 ± 0.6* | -0.3 ± 0.6* |
| IL-6 (ng/mL) | Diabetic group | 7.2 ± 0.8 | 14.0 ± 0.9 | 14.0 ± 0.7 | 13.0 ± 0.9 | 13.0 ± 0.7 |
| | Control group | 7.2 ± 0.8 | 14.0 ± 0.9 | 14.0 ± 0.7 | 13.0 ± 0.9 | 13.0 ± 0.7 |
| HbA1C (%) | Diabetic group | 10.5 ± 2.2 | 10.0 ± 2.5 | 9.5 ± 2.5 | -3.1 ± 1.7* | -4.1 ± 1.7* |
| | Control group | 10.5 ± 2.2 | 10.0 ± 2.5 | 9.5 ± 2.5 | -3.1 ± 1.7* | -4.1 ± 1.7* |

*Statistically significant change between time points (p < 0.05)

Results

Has the prevalence of periodontitis changed during the last 30 years?

Hugoson and Norderyd JCP 2008:35(suppl.):338-345

Aim:
Systematic review of global trends in the change in prevalence of periodontitis over the last 30 years

Conclusion:
Data indicate a possible trend of a lower prevalence of periodontitis in recent years

Periodontal diseases and health: Consensus Report of the Sixth European Workshop on Periodontology

Kinane and BouchardJCP 2008:35(suppl.):333-337

Conclusion:
A definitive statement on changes in prevalence of severe periodontitis over time is not possible

Results

Effect of non-surgical periodontal therapy on clinical and immunological response and glycaemic control in type 2 diabetic patients with moderate periodontitis

Navarro-Sanchez et al. JCP:2007:34:835-843

Conclusions
The clinical and immunological improvements obtained were accompanied by a significant reduction in HbA1C values in type 2 diabetic subjects.

Results

Diabetes mellitus promotes periodontal destruction in children

Lalla et al. JCP 2007:34:294-298

Agressieve parodontitis
Agressieve parodontitis (AgP) wordt gekenmerkt door:
• Medische anamnese zonder bijzonderheden.
• Snel optredend verlies van aanhechting en alveolair bot.
• Familiair voorkomen.

Agressieve parodontitis (AgP) wordt verder zeer vaak, maar niet altijd gekenmerkt door:
• Hoeveelheid plaque correleert niet met de ernst van het aanhechtingsverlies.
• Verhoogde aantallen Actinobacillus actinomycetemcomitans (nu: Aggregatibacter actinomycetemcomitans) en/of Porphyromonas gingivalis in de biofilm.

Agressieve parodontitis (AgP) wordt verder zeer vaak, maar niet altijd gekenmerkt door:
• Afwijkingen in de fagocyten.
• Overreacties van de macrofagen.

Lokale agressieve parodontitis
• Begint tijdens de puberteit.
• Goede „serum antibody response to infecting agents“.
• Eerste molaren en incisieven zijn betroffen.
Gegeneraliseerde agressieve parodontitis

- Begint meestal voor het 30ste levensjaar.
- Slechte „serum antibody response to infecting agents“.
- Afbraak van bindweefselaanhechting en alveolair bot in vlagen („bursts“).

CASE PRESENTATION

Case
Aggressive periodontitis

N. Christodoulides

Patient’s description

Date of birth: 04-08-1977
Date of intake: 08-06-2005
Age at intake: 28
Marital state: Non married, no children
Profession: Vehicle Tester (DAF)

Chief complaint:
Bad breath

Reason for referral:
Periodontal treatment

General Medical History:
A.S.A. score 1
No medication
Non-smoker

Dental History:
Extractions: 18, 28, 38, 48 in 2001 (Oral Surgeon)
Aware of periodontal condition for 1 year

Familial History:
Father and uncle diagnosed with periodontitis
Mother and brother periodontal state is unknown
Plaque and bleeding scores

Periodontal chart intake (08-06-2005)

Clinical findings at intake (08-06-2005)

- Reasonable plaque control
- Calculus
- Recessions up to 2 mm
- Probing pocket depths up to 11 mm with bleeding on probing
- Furcation involvement up to class II
- No mobility

Overview of the radiographs

Irregular bone loss up to 90%

Angular bony defects
Microbiological findings at intake (DNA test)

**Diagnosis**

Aggressive Periodontitis

**Etiology**

Bacterial plaque

**Preliminary treatment plan at intake**

- Oral hygiene instruction
- Initial periodontal treatment with the adjunctive use of antibiotics (Amoxicillin 500mg & Metronidazole 500mg TID/7 days)
- Reevaluation of oral hygiene and periodontal state
- Possible periodontal surgery
- Supportive periodontal therapy

**Plaque and bleeding scores at reevaluation**

- Plaque
- Bleeding

**Periodontal chart Reevaluation (18-01-2006)**

(6 months after initial therapy)

**Intake (08-06-2005)**

(6 months after initial therapy)
Reevaluation (18-01-2006) (6 months after initial therapy)

- Improved oral hygiene
- Reduction of the number of pockets with bleeding on probing
- Reduction of the number of deep pockets

Microbiological findings at reevaluation (DNA test)

- Improved oral hygiene
- Reduction of the number of pockets with bleeding on probing
- Reduction of the number of deep pockets

Definitive treatment plan

- Maintenance of the level of oral hygiene
- Evaluation of periodontal state after 6 months
- Possible periodontal surgery: 1st and 3rd sextant
- Supportive periodontal therapy
- Evaluation of periodontal state after 1 year
First sextant

<table>
<thead>
<tr>
<th>Table</th>
<th>Table</th>
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<tr>
<td>Evaluation (12 months)</td>
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<tr>
<td>3</td>
<td>7</td>
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<td>13</td>
<td>17</td>
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<td>21</td>
<td>25</td>
</tr>
<tr>
<td>29</td>
<td>33</td>
</tr>
</tbody>
</table>

First sextant – treatment overview

14-10-2006:
- Regenerative approach
- Enamel Matrix Derivative (Emdogain®)

First sextant

Bone sounding

Incision outline

EDTA (Pref-Gel®) & Emdogain® Application

Bony defect
Combined 3- 2- 1- wall 7 mm 16d
Combined 3- 2- 1- wall 9 mm 15m

Intake

7 months post op
**First sextant**

Intake

7 months post op

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**Third sextant**

Intake

Evaluation (12 months)

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**Third sextant**

Bone sounding

Incision outline

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**Third Sextant – treatment overview**

10-09-2006:
- Access flap
- Osteoplasty

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**Third sextant**

Buccal flap elevation
Bony defect 2 mm

Palatal flap elevation
Treatment performed

- Oral hygiene instruction
- Initial periodontal therapy with the adjunctive use of antibiotics (Amoxicillin 500mg & Metronidazole 500mg TID/7 days)
- Evaluation of oral hygiene and periodontal state
- Surgical intervention: 1st and 3rd sextant
- Supportive periodontal therapy

Bedankt voor uw aandacht!!